

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

(11) Publication number:

**0 119 104  
A1**

(12)

## EUROPEAN PATENT APPLICATION

(21) Application number: 84301782.3

(51) Int. Cl.<sup>2</sup>: B 65 B 1/22

(22) Date of filing: 15.03.84

(30) Priority: 15.03.83 GB 8307140

(43) Date of publication of application:  
19.09.84 Bulletin 84/38

(84) Designated Contracting States:  
IT

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(54) Box vibrating device.

(57) A device for ensuring uniform filling of a box with a loose material such as tobacco, the device comprising a spring mounted platform incorporating a roller conveyor (2) for moving the box (4) into the desired position at a filling station, and eccentric drive means (34, 36) connected to the platform to oscillate it on its springs (27).

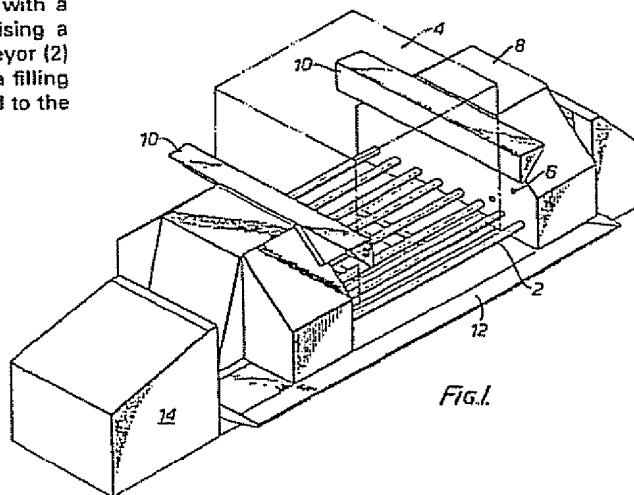


Fig. 1.

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'Box Vibrating Device'

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This invention relates to devices for filling boxes, and particularly to devices which are adapted to assist in properly filling a box with a loose particulate or fibrous material, such as tobacco, by vibrating the  
10 box as the material is added to it.

According to the invention there is provided a box filling device comprising a platform including a conveyor, the platform being mounted on suspension springs, and means for oscillating the platform on the  
15 springs, in a direction perpendicular to the direction of movement of the conveyor.

Preferably, the oscillation is provided by means of an eccentric drive mechanism.

In a preferred arrangement of the invention, a  
20 pair of pneumatically operated mutually opposed clamps are arranged to hold the box in position on the platform, whilst the platform is oscillated.

One embodiment of the invention will now be described by way of example, with reference to the  
25: accompanying drawings in which:

Figure 1 is a perspective view of a box filling device in accordance with the invention;

Figure 2 is a vertical cross section through a part of the device of Figure 1;

30 Figure 3 is a partially broken away end view of the device of Figure 1; and

Figure 4 is a side elevation of a vibrating drive arrangement for the device of Figure 1.

The device of Figure 1 is positioned in use so  
35 that the roller conveyor 2 is positioned below a filling

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device (not shown) which is adapted to pour material (such as tobacco) into the open top of a box 4 supported on the conveyor. In use, the box will be moved onto the conveyor from another conveyor, and when it is correctly  
5 positioned on the conveyor 2, the movement of the conveyor will automatically be stopped by means of a control mechanism connected to photocell detectors 6.

Figure 1 also shows the drive cover 8 for the conveyor mechanism, and a pair of retractable clamps 10  
10 which are mounted on the device in such a way that they can be engaged against opposite sides of the box, so as to hold it in position. The whole arrangement comprising the conveyor, the drive covers and the clamps 10, is mounted on vertical plate springs so that it can be  
15 oscillated in the axial direction of the rollers of the conveyor 2, by means of a vibrator drive which is connected to one end of the unit, and which is contained in the casing 14 shown in Figure 1.

Referring to Figures 2 and 3, the casing 8  
20 encloses an electric drive motor 16 which drives two of the rollers of the conveyor 2, via a chain 18 engaging with sprockets 20. The drive is in turn transmitted to the other rollers, by means of a further pair of chains 22, 24, which similarly engage with sprockets on the ends  
25 of each of the other rollers.

In the upper section of the casing 8, above the level of the motor 16, a pneumatic ram 26 is mounted with its head 28 pivotally connected to the clamp 10, so as to enable the clamp to be urged against the side of the box  
30 4, as best seen in Figure 2. It will be appreciated, that a similar pneumatic ram 26 is provided at the other side of the box to operate the other clamping head 10.

The plate springs 27 are connected to a sub-frame 30, which also carries a dust collection tray 12  
35 and is in turn mounted on anti-vibration pads 32 fixed to

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the floor.

Referring now to Figure 4, it will be seen that the longitudinal vibration of the apparatus is achieved by means of an eccentric drive device 34, driven by an electric motor 36, both of which are rigidly mounted on the floor, on the framework 30 supported by anti-vibration pads 38, and enclosed beneath the cover 14.

The connecting rod 40 of the eccentric drive mechanism 34 is pivotally connected to one end of a frame member 42 supporting the conveyor mechanism, so that when the motor 36 runs, the whole conveyor mechanism, including the rollers 2, the roller drives, and of course the clamps 10, are vibrated along with the box 4.

The sequence of operations of the apparatus is as follows: firstly, with the unit stationary, the clamp cylinders are retracted and the empty box is presented to the roller conveyor which is actuated to load the box in position. Its correct positioning is detected by the photo-electric cell 6.

The clamps 10 are then actuated at low pressure, and the motor 36 commences to run to start the oscillations. As the box is filled, the clamp pressure is gradually increased to a maximum, so as to compensate for the box loading. When the box is filled, the oscillations cease, the clamps are retracted, and the roller conveyor is actuated once again to off-load the box.

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CLAIMS

1. A device for ensuring uniform filling of a box with loose material such as tobacco, comprising: a  
5 platform (2) for supporting the box (4) at a filling station, the platform being mounted on suspension springs (27), and drive means (34, 36) for oscillating the platform on the said springs.
- 10 2. A device according to claim 1 in which the said springs comprise vertically extending metal plates whose upper ends are attached to fixed support members and whose lower ends are attached to frame members (42) of the platform.
- 15 3. A device according to claim 1 in which the drive means for causing the oscillation comprises a motor (36), an eccentric drive member (34) and a connecting rod (40) extending between the drive member  
20 and one side of the platform.
4. A device according to claim 1, further comprising a roller conveyor incorporated in said platform (2) for transporting the said box, into and away  
25 from the filling station.
5. A device according to claim 4 in which the said platform includes means (6) for sensing the position of the said box, and conveyor drive means arranged to move  
30 the box into position under control of the said sensing means.
6. A device according to claim 1 further comprising a retractable clamp means (10) adapted to grip  
35 the box on either side so as to hold it in position on

the platform whilst the platform is oscillated.

7. A device according to claim 6 further comprising pneumatic rams (26) for actuating the clamps  
5 and control means adapted to progressively increase the pressure of the rams as the box is filled, so as to compensate for the loading of the box.

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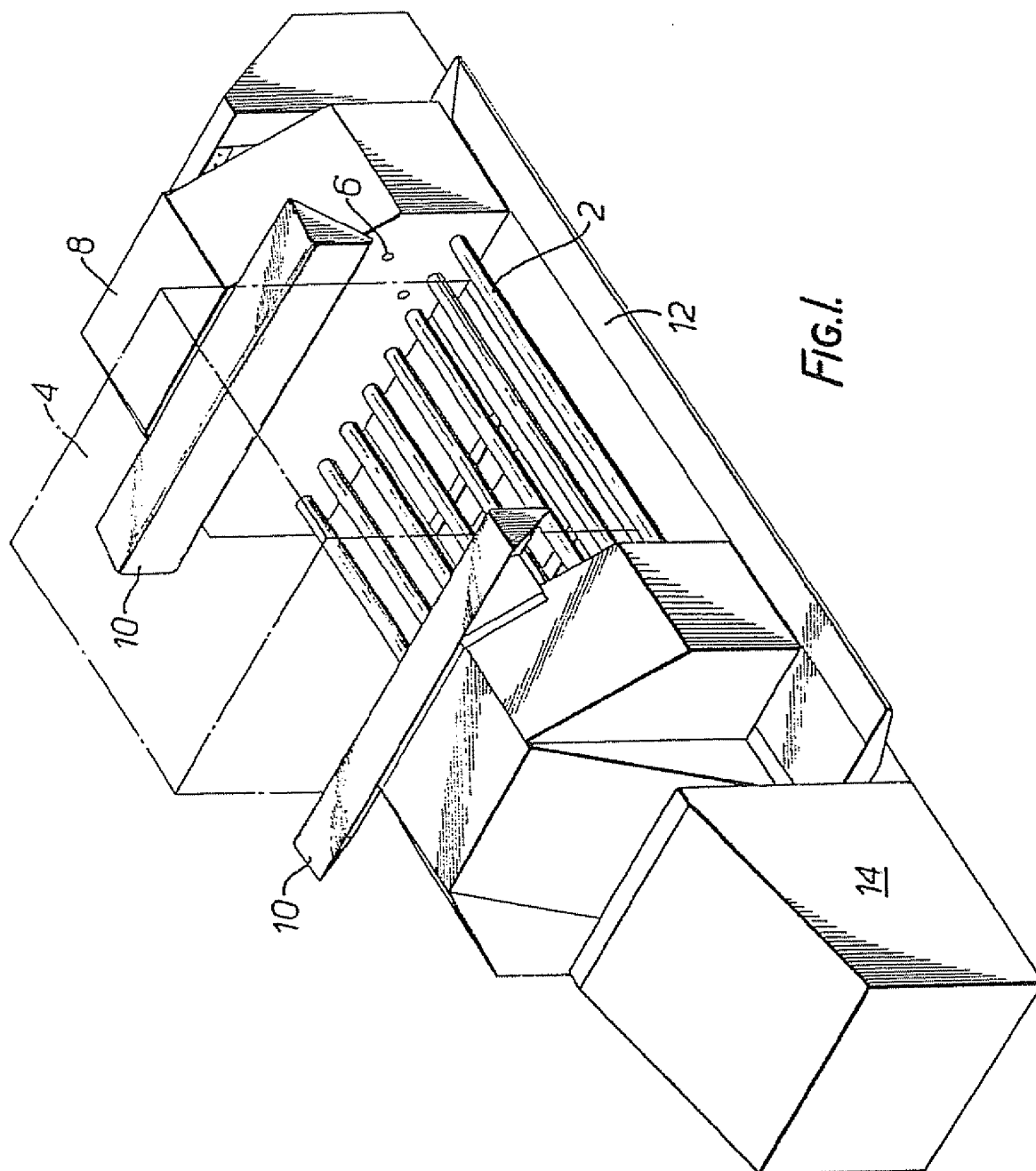
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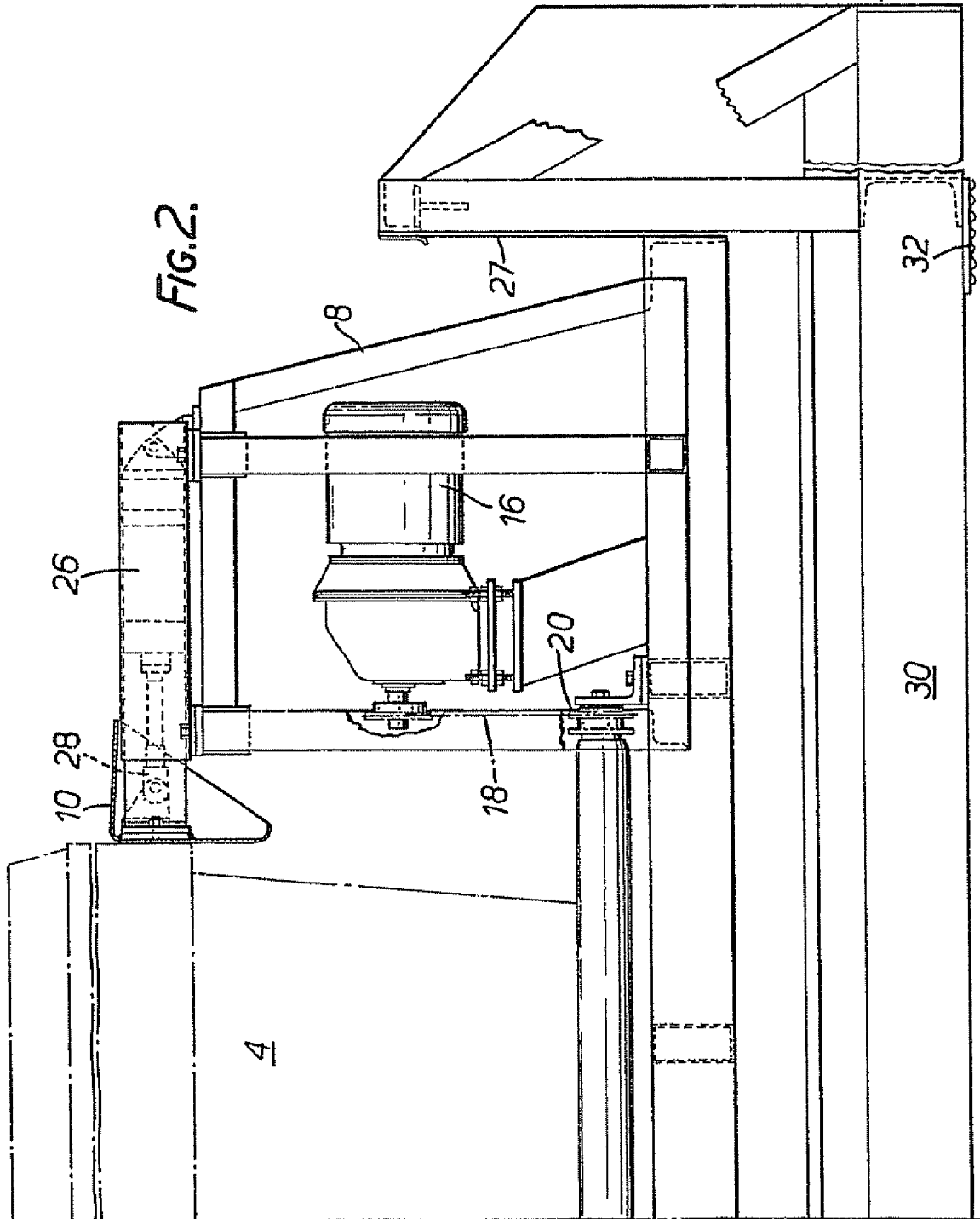
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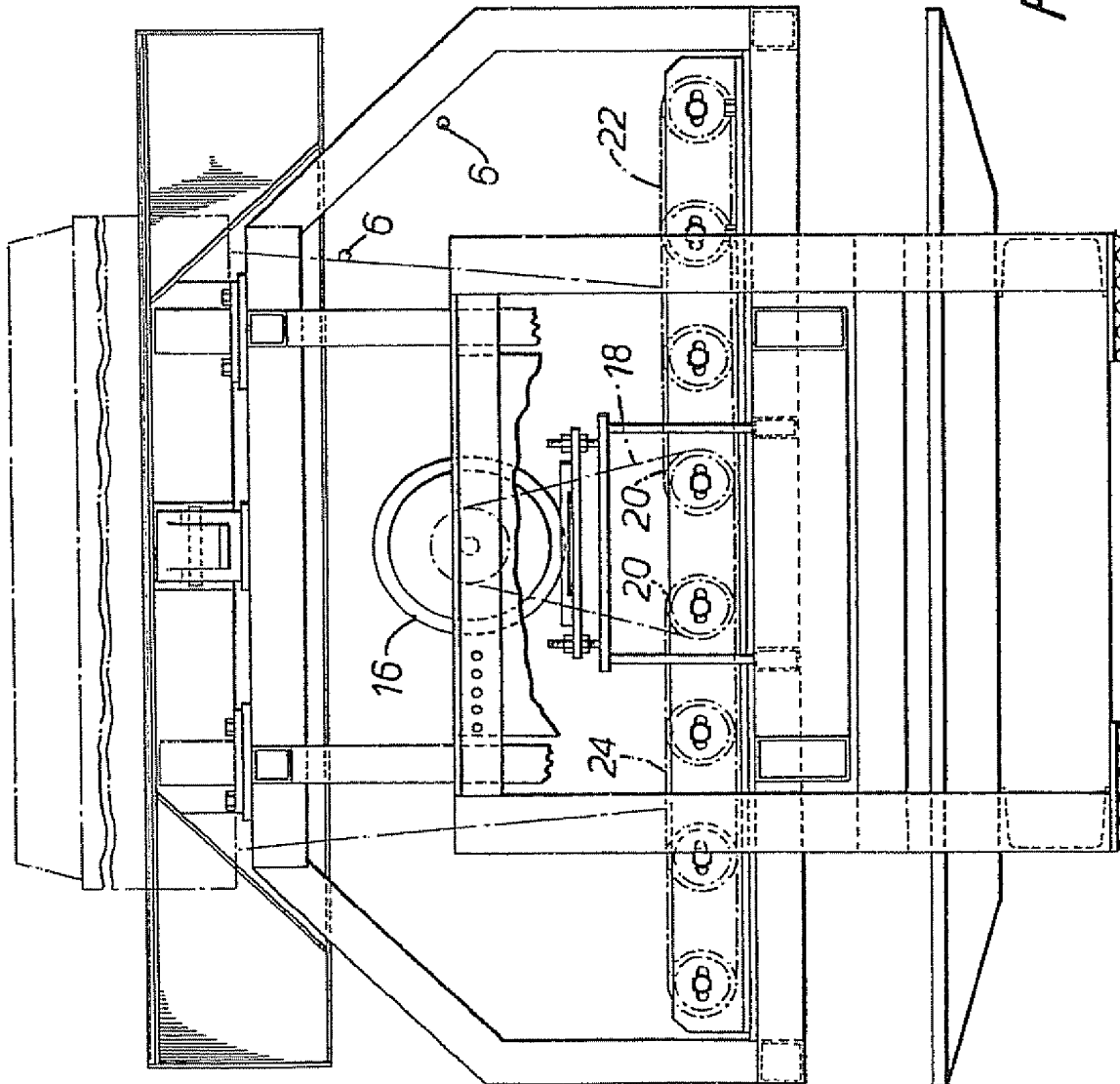
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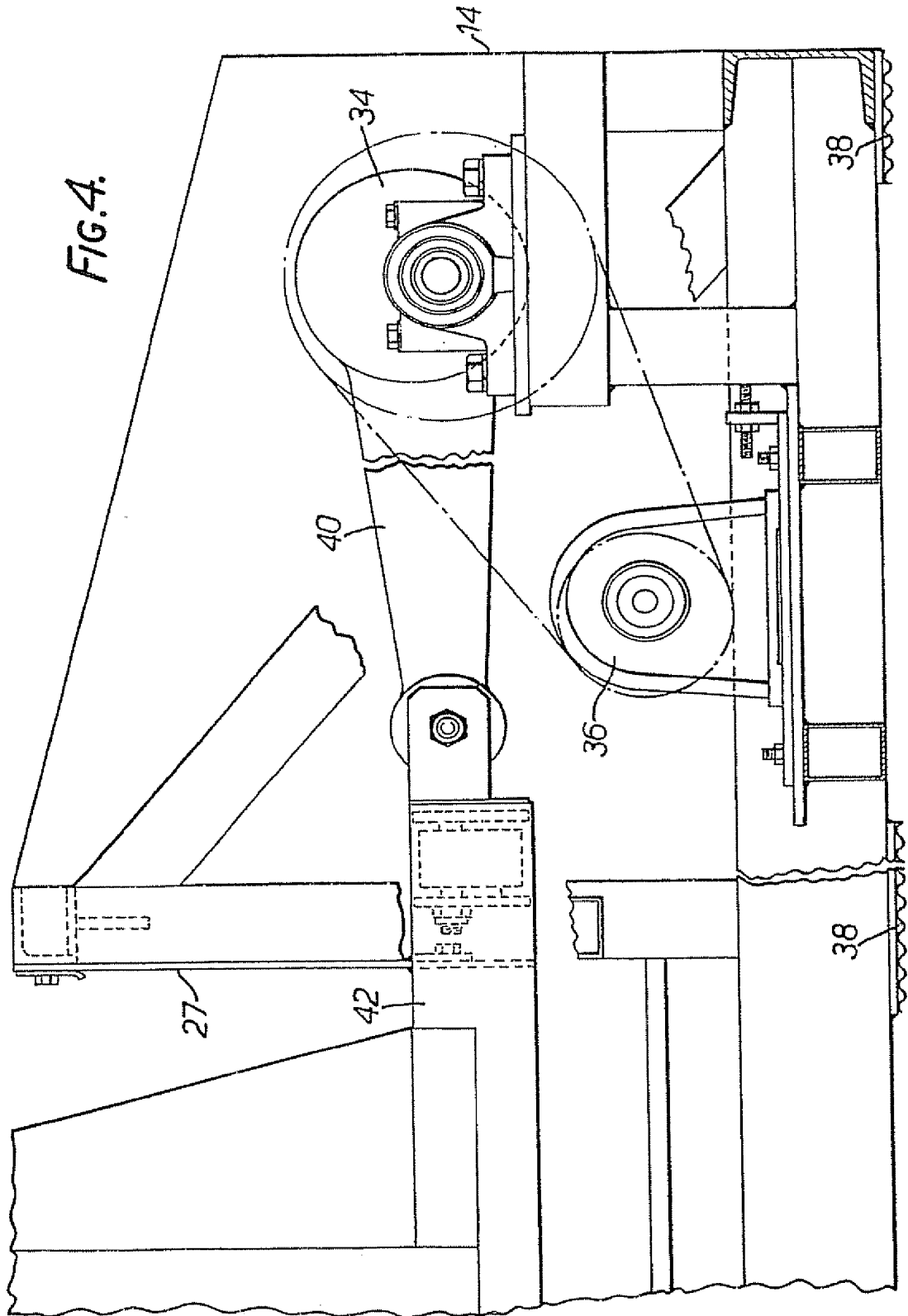
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FIG. 3.



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FIG. 4.





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# EUROPEAN SEARCH REPORT

0119104

Application number

EP 84 30 1782

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 2)
X	US-A-2 798 699 (PETERSON W.R. et al.) * Column 2, lines 28-40, 57-62; figure 1 *	1-3	B 65 B 1/22
X	US-A-3 146 997 (McKINNEY) * Column 4, lines 38-64; figure 1 *	1,3	
X	US-A-3 344 579 (GENTRY J.P. et al.) * Column 4, line 70 - column 5, line 2; figure 1 *	1	
A		5	
Y	BE-A- 545 869 (GUNNEBO BRUKS AKTIEBOLAG) * Page 3, line 26 - page 4, line 5; figure 1 *	1-4, 6	TECHNICAL FIELDS SEARCHED (Int. Cl. 2) B 65 B
Y	GB-A- 480 760 (FINCHER S.) * Page 2, lines 85-102; page 3, lines 23-26; figures 1,5 *	1-4, 6	
A	US-A-3 167 304 (LEMMOND E.C.) * Column 2, lines 21-23; figure 1 *	4	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07-06-1984	Examiner GRENTZIUS W.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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